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AUTHOR N[illegible]worski, Teresa; And Others
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ABSTRACT

A group of 144 kindergarten and third grade students heard stories in which the information necessary to infer the protagonist's motives was varied as to its form and location in a story sequence. In all story variations, the semantic content of the information was held constant. All children completed three tasks: a moral judgment concerning the goodness or badness of the protagonist's behavior, recall of the entire story, and a series of probe questions about the story events. The results indicated that information related to motives was recalled equally well independently of where it occurred in the story or in what category it was placed. Similar results were found when moral judgment scores were analyzed. The form or location of information did not alter moral evaluations. The data suggest that prior findings on differential recall of story categories depend on uncontrolled content and the relation among statements to the main goal rather than the form or location of the category. (Author/DF)

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Technical Report No. 129

STORY STRUCTURE VERSUS CONTENT EFFECTS ON CHILDREN'S RECALL AND EVALUATIVE INFERENCES

Teresa Nezworski
University of Minnesota

Nancy L. Stein
University of Illinois

Tom Trabasso
University of Minnesota

June 1979

University of Illinois
at Urbana-Champaign
51 Gerty Drive
Champaign, Illinois 61820

Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, Massachusetts 02138

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Abstract

Kindergarten and third grade children heard stories where the information (labelled Special Information) necessary to infer the protagonist's motives was varied as to its form and location in a story sequence, (i.e., the grammatical category of a story). In all story variations, semantic content of the Special Information was held constant. All children completed three tasks: (a) a moral judgement concerning the goodness or badness of the protagonist's behavior, (b) recall of the entire story, and (c) a series of probe questions about the story events. The results indicate that information related to motives is recalled equally well, independent of where it occurs in the story or in what category it is placed. Similar results were found when moral judgement scores were analyzed. The form or location of Special Information did not alter moral evaluations. The data suggest that prior findings on differential recall of story categories depend on uncontrolled content and the relation among statements to the main goal rather than the form or location of the category.

Story Structure Versus Content Effects on Children's Recall and Evaluative Inferences

Since Piaget's (1932) seminal book on moral reasoning, considerable attention has been devoted to the question as to whether the child uses intention information to make moral judgements. In Piaget's view, the less developmentally advanced child reasons on the basis of objective evidence, and therefore, evaluates others on the basis of the consequences of their behavior. In contrast, the more developmentally advanced child reasons subjectively and evaluates others on the basis of their intentions for their behavior. Keasey (1978) has pointed out that Piaget's criteria for evaluation involve not only memory of intention information but also use of this information in the moral judgement process.

Recently, distinctions have been made between the concepts of motive and intentionality (Berndt & Berndt, 1975; Heider, 1958; Keasey, 1978; Shantz, 1975). A motive refers to the person's goal or reason for performing an action whereas an intention refers to whether an action and/or its consequences were foreseen or deliberately caused by the person. Both of these factors are of importance in the assessment of the moral evaluations children make of other's behavior. However, in the present paper, we will be concerned with children's ability to use information about a person's motives or goals in making evaluations and not with their ability to attribute intentionality to story characters.

The question of using information to infer motives implies that the source of the information is important. The primary means of communicating

information about motives to children in studies of moral judgement are stories. In her review, Shantz (1975) discusses the considerable variability in the way in which such information is portrayed. For example, motives may be inferred from implicit or explicit statements about the story characters, their goals, their actions, the direct consequences for themselves and others, and their or other's reactions to these events. Thus, a clear interpretation of the child's ability to use motive information is obscured by the lack of specificity and consistency in controlling for the source of motive information in the story.

A method of specifying information sources in stories has recently been developed by Mandler and Johnson (1977) and Stein and Glenn (1979, Note 1) in an effort to describe the structural basis for story memory. According to Stein and Glenn, motive information can come from six main sources in a simple, one episode story. The first source is termed the setting, which introduces the protagonist(s) and often provides additional information about the physical and/or social context of the story (e.g., "Mary and John were enemies at school"). The second source is the initiating event and it denotes a change in the protagonist's habitual enviornment and may contain novel actions or events which operate on the character (e.g., "John called Mary a brat"). The third source is the internal response of the character and most frequently includes information about the character's goals (e.g., "Mary wanted to hit John"), but can include feelings (e.g., "Mary became very angry"), cognitions ("Mary thought John was obnoxious"), or plans. A fourth source is described as the attempt category

and concerns the character's overt behavior (e.g., "Mary hit John"). Fifth is the consequence category wherein the direct results of the action are described (e.g., "John got a black eye"). Finally, the sixth source is the reaction category where the character(s) responds to the consequences of the actions, i.e., they feel surprised, guilty, upset, etc. (e.g., "Mary felt glad that she hit John"). It should be clear from all the examples given in the parentheses above that one can make inferences about Mary's motives from each source separately or in some combination.

In studies of recall of stories by children (Mandler & Johnson, 1977; Stein & Glenn, Note 1, 1979), these sources of information differ in how well they are remembered. The most frequently recalled categories are setting statements, initiating events, and consequence statements. Attempts are next in recall frequency, with internal response and reaction statements being least well recalled. Given that categories as information sources differ in their ease of recall, they may also differ in how easy it is for a child to use them to make inferences necessary for moral judgements.

Note, however, that these sources of information covary in a least three ways: their syntactic form, their relative location in a story, and their semantic content. The ease of recall and use of this information for inferences may thus depend upon one or more of these variables. In the work on moral development and story recall, these factors are also totally confounded. Therefore, the main purpose of the present study was to hold constant the semantic content necessary for inferring the character's motives by embedding the content in different categories across versions of a common story.

In effect, we are controlling semantic content and varying the form and location of the information source. While it is unclear what difficulties children may have in dealing with different syntactic factors in story categories, location has been shown to affect moral judgements by young children. When the information is recent, it carries more weight in influencing these judgments, regardless of whether the source is an internal response or consequence statement (Feldman, Klosson, Parsons, Rholes, & Ruble, 1976; Austin, Ruble, & Trabasso, 1977).

Alternatively, Stein (1979) has argued that the logical relations among statements (e.g., whether statements are causally related) and the relationship of these statements to a character's goal should predict whether or not a statement is recalled. In fact, the one exception to the relatively low recall of internal response statements is the high degree of recall of the character's main goal (Stein & Glenn, Note 1, 1979). In the present study, all the information sources which are being manipulated allow inferences about the motives (goals) of the story character. If Stein's (1979) argument is valid, there should be no difference between information sources as to recall and usage in making moral judgements. Furthermore, statements from which motives can be inferred should be recalled frequently.

Method

Procedure

All children were tested individually. Children were told to listen carefully and that they would hear three stories. They were also told that they would be asked to recall the story and answer questions about what happened in the story.

Training on the use of the response scale for moral judgements then followed. The experimenter familiarized the child with the meaning of each point of the scale by placing a finger on that point and describing its value as follows:

> The first dot (No. 1 on the scale) is for someone who is very, very bad. The next dot (No. 2 on the scale) is for someone who is bad but not as bad as the first dot. This dot (No. 3 on the scale) is for someone who is just a little bad. This middle dot (No. 4 on the scale) is for someone who is a little bad and a little good. This dot (No. 5 on the scale) is for someone who is a little good. This dot (No. 6 on the scale) is for someone who is good. And the last dot (No. 7 on the scale) is for someone who is very, very good.

The child was then asked, in a random order, to point to the specific dots on the scale in response to verbal descriptions of the value of the dot. The criterion for comprehending the scale was correct pointing to each dot for four successive responses.

Presentation order of the three stories was counterbalanced in a Latin-square design. At the conclusion of the first story, the experimenter asked the child to point to the dot to show how good or bad the character was in the story. Then, the experimenter asked the child to retell the story just as it was heard.

Probe questions for the story were then asked. The same procedure was repeated for the second and third stories. All the responses were tape-recorded and subsequently transcribed.

Subjects

The 144 subjects were white, middle-class students from kindergarten and third grades at two schools in Minneapolis, Minnesota. At each grade level there were 72 boys and 72 girls. The median ages were 5.8 (5.3-6.2) and 8.8 (8.1-9.3).

Story Materials

Normal version. Three different stories were constructed, conforming to the specifications outlined in the Stein and Glenn (1979) grammar for a well-formed episode. Each story consisted of six ordered categories (Setting, Initiating Event, Internal Response, Attempt, Consequence, and Reaction) with two sentences per category. We will refer to these stories as the normal version. An example of the normal version for The Secret Trip story is given in Table 1.

Insert Table 1 about here.

Experimental versions. An experimental version of a story consisted of a normal version PLUS the addition of two sentences, which we will call Special Information. Five experimental versions were constructed for each story, each version containing the Special Information in a different category. The five categories corresponded respectively to the Setting, Initiating Event, Internal Response, Consequence, and Reaction categories. For each of the three stories, the semantic content from which one could evaluate the protagonist's actions or motives was contained in one of the five categories. For example, in the Secret Trip story, the key

propositions were (a) that the next day was Peter's birthday and (b) that Peter will receive a birthday present from Mary. The differences between the Special Information categories were generated by altering the syntactic form of these propositions, and by locating the propositions in a position within the normal story version corresponding to the category in question. Examples of placement of the Special Information generated for the Secret Trip story are given in Table 2.

Insert Table 2 about here.

The normal story versions for the other two stories (The Fox and the Bear; Tiger's Whisker) as well as their corresponding Special Information categories are given in the Appendix. The Special Information was inserted into the experimental versions as follows: for the setting and consequence categories, the Special Information appeared after the respective normal setting and consequence statements, while for the remaining categories, the Special Information appeared before the normal category statements.

Thus, there were six versions, one normal and five experimental of each of three different stories. The three stories varied as to theme: lying (Secret Trip), personal injury (Tiger's Whisker), and stealing (Fox and Bear). The different themes were used to provide generalization of the findings across stories as well as to contrast situations which children treat as socially undesirable.

Response Scale

The response scale was a laminated line drawing consisting of seven dots located 1/2 inch apart with a frowning face serving as the left anchor and a smiling face as the right anchor. Subjects indicated their choice by placing their finger on a dot. Each dot was assigned its corresponding value on a seven-point scale with the value "1" being assigned to the most negative dot.

Probe Questions

Four types of probe questions were constructed to obtain information about the children's memory and understanding of (a) the Special Information, (b) the consequences of the protagonist's acts, (c) the reaction of the "victims," and (d) the motivation or causal factors for the various story character's actions or feelings. Examples of each type of probe question generated for the Secret Trip story are shown in Table 3.

Insert Table 3 about here.

Two probes, related to the Special Information, were generated for each story; one probe related to each proposition in the Special Information. For example, in order to assess understanding of the Special Information category propositions, "The next day was Peter's birthday" and "Mary always gave Peter a birthday present," we asked:

1. What was going to happen to Peter on the next day?
2. What did Mary think about giving Peter?

Responses for the first probe were scored as correct when either of the

key words "birthday" or "present" were mentioned. For the second probe, correct responses contained the key words "skateboard" or "present."

One question for each of the consequence and reaction categories as well as three questions concerning motivation were generated for each story. Correct answers to all three types of questions could not be found directly in the text but could be inferred from text statements. For example, in order to answer the third motivation question for the Secret Trip story (see Table 3), the child would have to go beyond the specific information presented and connect the Special Information statement, "Mary always gave Peter a birthday present," with the consequence statement, "Mary bought a brand new skateboard," to give the correct response, "Mary gave Peter the skateboard for his birthday."

Results and Discussion

If the children took into account the implicit motive information from the Special Information categories then one would expect their judgements of the protagonist to be less negative than for that of the control condition where no such information was available. To assess this, two analyses of variance were performed using the scale value rating for each story by each child as the dependent measure. In the first analysis, all conditions were included along with grade as between-subject factors and story was treated as a within-subject factor. In the second analysis, the control condition was excluded. Two findings are of central interest: in the first analysis, the condition effect was significant, $F(5,108) = 11.03$, $p < .01$. However, in the second analysis when the control condition was removed, this factor became statistically non-significant, $F(4,90) = 0.83$.

The mean rating for each condition and grade is shown in Figure 1.

Insert Figure 1 about here.

As can be seen in Figure 1, the judgements were more negative in value for the control condition than for the Special Information conditions and the means for the latter were nearly equal in value within each grade level. Thus the children within each age group made equal use of the implied motive information from all grammatical categories.

In addition, grade was also significant in both analyses of variance, $F(1,108) = 10.06$ and $F(1,90) = 5.73$, $p < .05$. The means of the control condition for the kindergarten and third grade groups were 1.2 and 2.2 respectively; for the other conditions combined, they were 3.32 and 3.80. Since the difference in the ratings for the younger and older children was reflected in the control as well as the Special Information conditions, the age differences are attributable to the fact that younger children were more severe in their judgements across all conditions. However, the children shifted their evaluation upward to about the same degree.

Finally, the three stories differed in their effects in the analyses, $F(2,216) = 68.83$ and $F(2,180) = 58.16$, $p < .01$. For the controls, the respective mean ratings for the Secret Trip, Tiger's Whisker, and Fox and Bear stories were 2.05, 1.85, and 1.25. For the Special Information conditions, they were 4.53, 3.70, and 2.39 respectively. In effect, the ratings doubled in value with addition of the Special Information and did not interact with story. One interpretation is that the children were more severe in judging stealing (Fox and Bear) than personal harm (Tiger's

Whisker) and in judging personal harm more severely than lying to a friend (Secret Trip). The effect of the Special Information was, in ratio terms, about the same for all three stories.

The above results indicate that the children made equal use of the Special Information independent of both grade level and story content. No other significant main effects of interactions were found in either analysis of variance.

Story grammar category effects. Since the normal versions of the stories used in the present study were generated according to a well-formed episodic structure as defined by the Stein and Glenn (1979) grammar, the category of each statement recalled was scored using semantic criteria. That is, if the semantic content of a statement was judged to be present in a recall protocol, then credit was given for recalling each particular category statement. Two judges independently scored the recall protocols according to this criterion and the percentage agreement was 98%. Differences in classification were resolved through discussion. Then, for each child the number of statements recalled for each category (Setting, Initiating Event, Internal Response, Attempt, Consequence, and Reaction) of the normal version for each story was counted and entered into an analysis of variance with grammatical category as an additional within subject factor. This analysis yielded a significant category effect, $F(5,660) = 316.20$, $p < .01$. The percent correct recall for each grammatical category in the normal version is shown in the left panel of Figure 2.

Insert Figure 2 about here.

As can be seen in Figure 2, the grammatical categories of the normal versions, where form, location, and content all varied were recalled in a manner similar to that found by Stein and Glenn (1979, Note 1) and Mandler and Johnson (1977).

The degree of agreement on the rank order of category recall for each grade across the control and five experimental conditions was assessed by coefficients of concordance and was found to be exceptionally high for both grade levels: for the kindergarten children, $\underline{W} = .90$, $\underline{\chi}^2(5) = 27.05$ and for the third grade children, $\underline{W} = .89$, $\underline{\chi}^2(5) = 26.83$, both $\underline{p} < .01$. Furthermore, the agreement over both grades was equally high, $\underline{W} = .86$, $\underline{\chi}^2(5) = 51.51$, $\underline{p} < .01$. The mean ranks over grade level were 1.25 for Consequences, 2.38 for Initiating Events, 3.17 for Settings, 3.21 for Attempts, 5.00 for Internal Responses, and 6.00 for Reactions.

Although the analysis of variance indicated significant story by category and grade by category interactions, an examination of the category ranks indicated high agreement across stories and grade. The only variation in agreement on rank was among the values of Attempts and Settings which were nearly equal in strength of recall and ranked either 3 or 4 among the set of six categories. Thus the order of category salience in recall as depicted for the normal versions on the left side of Figure 2 is general across stories and ages and is consistent with prior findings.

The next question of central interest concerns the frequency of recalling the Special Information where the content was held constant and form

and location of this information varied. The number of correct statements recalled by each child for each Special Information category for each story in each condition was obtained using semantic criteria as before and was entered into an analysis of variance with the control condition excluded since they had only the normal version without Special Information added. In this analysis, the condition effect was statistically non-significant, $F(4,110) = 1.98$, $p < .05$. The percent recall for the conditions where each represents a different grammatical category is shown in the right panel of Figure 2.

The contrast between the two figures is striking. When the form, location, and content all covary, as in the normal story version, the grammatical categories differ in degree of recall. However, when the content is made common across categories and only form and location covary, the differences disappear. Our conclusion is that previous differences reflect semantic more than syntactic or locational differences.

Probed Special Information category recall. After the children freely recalled a story, they were asked several probe questions, among which was one question for each statement of the Special Information category. The responses to these questions were scored correct if they contained the semantic content which matched that in the original story statement. For example, a probe question for the Secret Trip story was "What was going to happen to Peter on the next day?" A correct response would be "His birthday" or "He would get a present." An analysis of variance was performed on the correct responses for each story by each child with grade and condition as between-subject factors and story as a within-subject factor.

The results resembled closely those found in free recall. In particular, there was no significant condition effect, $F(4,110) = 1.28$. As before, there were significant grade and story effects. For the respective Setting, Initiating Event, Internal Response, Consequence, and Reaction conditions, the percent correct free recall was 63, 65, 54, 60, and 54.

Form and location changes. Further analyses on the recall of the Special Information categories revealed that form and location transformations occurred in recall, especially for the less salient Internal Response and Reaction categories. For each statement that was recalled, its form and location in the recall, relative to other statements, were analyzed. If the surface form of the statement was recalled as given in the story, it was scored as "Not transformed." However, if the form recalled differed from that given, a judgement was made as to which grammatical category the proposition belonged according to form criteria. For example, "They wanted whiskers for his medicine," was judged to be an Internal Response when, in fact, the information given was a Setting, namely, "Everyday he took a medicine made with a tiger's whisker." In essence, statements which were transformed into Settings were expressed as states; those transformed into Initiating Events were expressed as actions involving other agents; those transformed into Interna Responses were expressed as goals, feelings, or thoughts; those transformed into Attempts were expressed as actions by the protagonist; those transformed into Consequences were expressed as resultant actions; and those transformed into Reactions were expressed as feelings. Transformations may also be viewed as deletions. In particular for Internal Responses, verb clauses such as "She knew that" were frequently

deleted leaving Setting statements such as "Her husband was sick." For Reactions, "Mary was excited" was also deleted leaving Consequences such as "Mary gave Peter a birthday present" or "She made the medicine."

The data on the percentage of form transformations for all the children are summarized in Table 4 since there were no discernible grade level or story differences.

Insert Table 4 about here.

As seen in Table 4, Reactions (with probability = .76) underwent the most transformations in recall and Internal Responses are second (with probability = .43). These data suggest that children may recall the semantic content but not the form of Reactions and Internal Responses as well as the other grammatical categories.

The location of a Special Information category statement was determined by its position in the recall protocol relative to the content of the statements from the normal version. The latter had been scored as to category by semantic criteria so that we used this information to determine location changes where location is defined as the expected position in a well-formed episode. For example, if the normal version Setting and Internal Response statements were recalled and if the Special Information statements were recalled between these it would be judged to have the location of either a Setting, Initiating Event, or an Internal Response. Whether it changed location depended on where and what it was in the original story. So in the preceding example, if the Special Information was presented as a Setting, Initiating Event, or Internal Response, its location was judged as unchanged.

If it was presented as a Consequence or Reaction, however, it would have been judged as changed in location. Table 5 summarizes the percentage of statements recalled which remained the same or changed in location.

Insert Table 5 about here.

The location data in Table 5 resemble those for Table 4 in that Reactions (with probability = .68) and Internal Responses (with probabilty = .32) underwent the greatest change in location. Settings and Consequences were virtually unchanged. Overall, the relationship between form transformation and location change was very high since the conditional probability of a change in location given a transformation was .87.

Taken together, the form and location findings may help explain the relative lower salience in recall of the Reaction and Internal Response categories. Children may delete from recall those statements for which they cannot readily retrieve and express the initial clauses. In our data on recall of the Special Information categories, however, this hypothesis does not seem reasonable. That is, we did not find omission of Internal Responses or Reactions to be greater than omission of the other categories. Alternatively, it is possible that when investigators score recall of these categories, they are multiple criteria of form, location, and content of the statements. If so, since children more frequently change the form and location of Reaction and Internal Response categories, the scoring results would favor recall for the other categories.

Story recall. When the Special Information was added to the normal versions of the stories, we, in effect, added two more statements. We

examined whether this additional information affected recall of the normal story statements by entering the total number of statements recalled per story for each child into an analysis of variance including the control and five experimental conditions. Generally, the results indicate neither facilitation nor interference by the additional information, and are summarized in Figure 3 which shows the percent of statements recalled for each grade level and condition.

Insert Figure 3 about here.

However, in the analysis, there was a significant effect for condition, $F(5,132) = 8.49$, $p < .01$, grade, $F(1,132) = 106.85$, $p < .01$, and grade by condition interaction, $F(5,132) = 4.77$, $p < .01$. From Figure 3, it appears that the third grade children in the Initiating Event condition recalled more propositions, while the kindergarten children in the Setting condition recalled less relative to the other conditions within their respective grade level. Although the reasons for these differences are unknown, the balance of the evidence favors the conclusion that the addition of the Special Information category had no effect on the recall of the normal story statements.

There are reasons to believe that the additional information might have aided recall since it provided an explicit source for inferring the protagonist's goal plus it gave the reason for the formation of a character's goal for a richer interpretation of the events in the story and additional goal information to which the other events are causally related (Stein,

to construct a better representation of the story and hence lead to better recall. However, this does not appear to be the case and is similar to the findings of Omanson, Warren and Trabasso (1978), where story recall was found to be unaffected by the addition of setting and motive information, although comprehension was significantly affected.

Inferences. In the set of probe questions for all three stories, there were eight inference questions of a causal nature, three questions on the consequences of the protagonist's actions, and three questions on the reactions of the character affected by the action. We analyzed performance on inference questions by the control condition alone, by the control condition combined with the other, Special Information conditions, and by the Special Information conditions excluding the control.

For all three inference types, there were no statistical differences between the Special Information category conditions at the .05 level. However, adding the control led to significant differences for the causal and consequence inferences. The respective F's (with 5,132 degrees of freedom) were 20.69, 47.40, and 1.83. In addition, grade effects were found for all inferences in the Special Information conditions. For the Control condition, grade differences occurred only for the Reaction inferences. Table 6 summarizes these results.

Insert Table 6 about here.

The data in Table 6 indicate that the older children were better at answering inferential questions, consistent with the findings of Paris and Upton (1976) and Omanson et al. (1978). The remaining differences

either between types of inferences or between the Control and Special Information conditions, can be accounted for by the kind of information available in the stories. That is, the reactions could be validly inferred from all versions whereas most of the causal and consequential probes required knowledge of the Special Information category.

Correlations. In an attempt to examine possible relations between various memory and inference measures, we calculated a number of correlations. In general, the best predictors of moral judgements were how well children retained the Special Information category. The other measures resulted in either low postitive or non-significant correlations. Table 7 summarizes the data for the two grades by displaying correlations between various retention and inference measures with the moral judgement ratings.

Insert Table 7 about here.

The data in Table 7 indicate that individual differences in making evaluative inferences depend upon retention of the specific information semantically necessary for the evaluation and not so much on either general retentive ability (as measured by free recall of other propositions) or on other inferential ability (as measured by inference probe questions). Inferential reasoning appears to be knowledge based rather than a property of memory or inferential capabilities per se.

In sum, our findings clearly indicate that young children, 5 to 8 years in age, can infer and use motive information from a variety of sources in stories to make moral judgements. In fact, we found no age

difference in the relative degree to which such usage was made. The results stress the importance of controlling for the content and not the category (form or location) of the information source in the story. Therefore, one cannot assert, as did Piaget (1932), that children rely on either intentions or consequences, since we have shown that motives are inferred from these as well as other identifiable sources in stories. Inferences and their usage would seem to be independent of the particular source as long as the appropriate semantic information is available.

The data also suggest that statement category differences in story recall depend on semantic rather than form or location factors. Since our control was on semantic content related to motives, we are reluctant to generalize these results to content not causally related to goals. Conceivably, a contrast between the importance of goal related and other category content for recall and comprehension of stories could be made in subsequent studies using procedures outlined in the present investigation.

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Footnote

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Table 1

Example of the Normal Version of the Secret Trip Story

Setting	Once there were two kids named Peter and Mary who lived across the street from one another.
Initiating event	One morning, Peter called Mary and asked Mary to come over and play.
Interest response	But Mary wanted to go shopping and she didn't want to tell Peter where she was going.
Attempt	So Mary told Peter she was sick and couldn't come over to play.
Consequence	Then Mary went shopping and bought a brand new skateboard.
Reaction	Mary thought it was a really special toy and was glad she had kept her shopping trip a secret from Peter.

Table 2

Special Information Categories of the Secret Trip Story

Setting	The next day was Peter's birthday and Mary always gave Peter a birthday present.
Initiating event	Mary's friend told her that the next day was Peter's birthday and that he might like a birthday present.
Internal response	Mary knew that the next day was Peter's birthday and she thought about a birthday present.
Consequence	Mary gave Peter a birthday present on the next day.
Reaction	Mary was excited about giving Peter a birthday present on the next day.

Table 3

Probe Questions for the Secret Trip Story

Special Information

1. What was going to happen to Peter on the next day?
2. What did Mary think about giving Peter?

Consequence

1. What did Mary do with the skateboard?

Reaction

1. How did Peter feel when Mary told him she was sick?

Motivation

1. Why did Peter feel the way he did when Mary told him she was sick?
2. Why did Mary tell him she was sick?
3. Why did Mary give Peter the skateboard?

Table 4

Form Transformations of Special Information Categories in Recall

Category Given	Proportion of Category Statements Recalled						Total Number Recalled
	Setting	Initiating Event	Internal Response	Attempt	Consequence	Reaction	
Setting	.96	.00	.03	.00	.01	.00	92
Initiating Event	.14	.85	.00	.00	.01	.00	93
Internal Response	.36	.00	.57	.00	.06	.00	77
Consequence	.04	.00	.00	.00	.96	.00	72
Reaction	.07	.01	.00	.01	.66	.24	79

Table 5

Location Transformations of Special Information Categories in Recall

Category Given	Proportion of Category Statements Recalled						Total Number Recalled
	Setting	Initiating Event	Internal Response	Attempt	Consequence	Reaction	
Setting	.96	.00	.03	.00	.01	.00	92
Initiating Event	.12	.85	.00	.00	.01	.02	93
Internal Response	.25	.01	.68	.00	.06	.00	77
Consequence	.04	.00	.00	.00	.96	.01	72
Reaction	.08	.01	.01	.03	.55	.32	79

Table 6

Proportion of Correct Inferences Made to Probe Questions

Inference Type	Control		Added Information Conditions	
	K	3	K	3
Causal	.36	.38	.64	.87
Consequence	.33	.33	.82	.96
Reaction	.89	.97	.88	.97

Table 7

Relation Between Judgments and Recall and Inferences

Measure	Pearson Product Moment Correlations	
	Grade	
	K	3
Free Recall of Normal Story Proposition	.23*	.12
Free Recall of Special Category Information	.52**	.28*
Probe Recall of Special Category Information	.44**	.27*
Probed Causal Inference	.14	.19
Probed Consequence Inference	.14	.22*
Probed Reaction Inference	.21	-.14

* = $p < .05$

** = $p < .01$

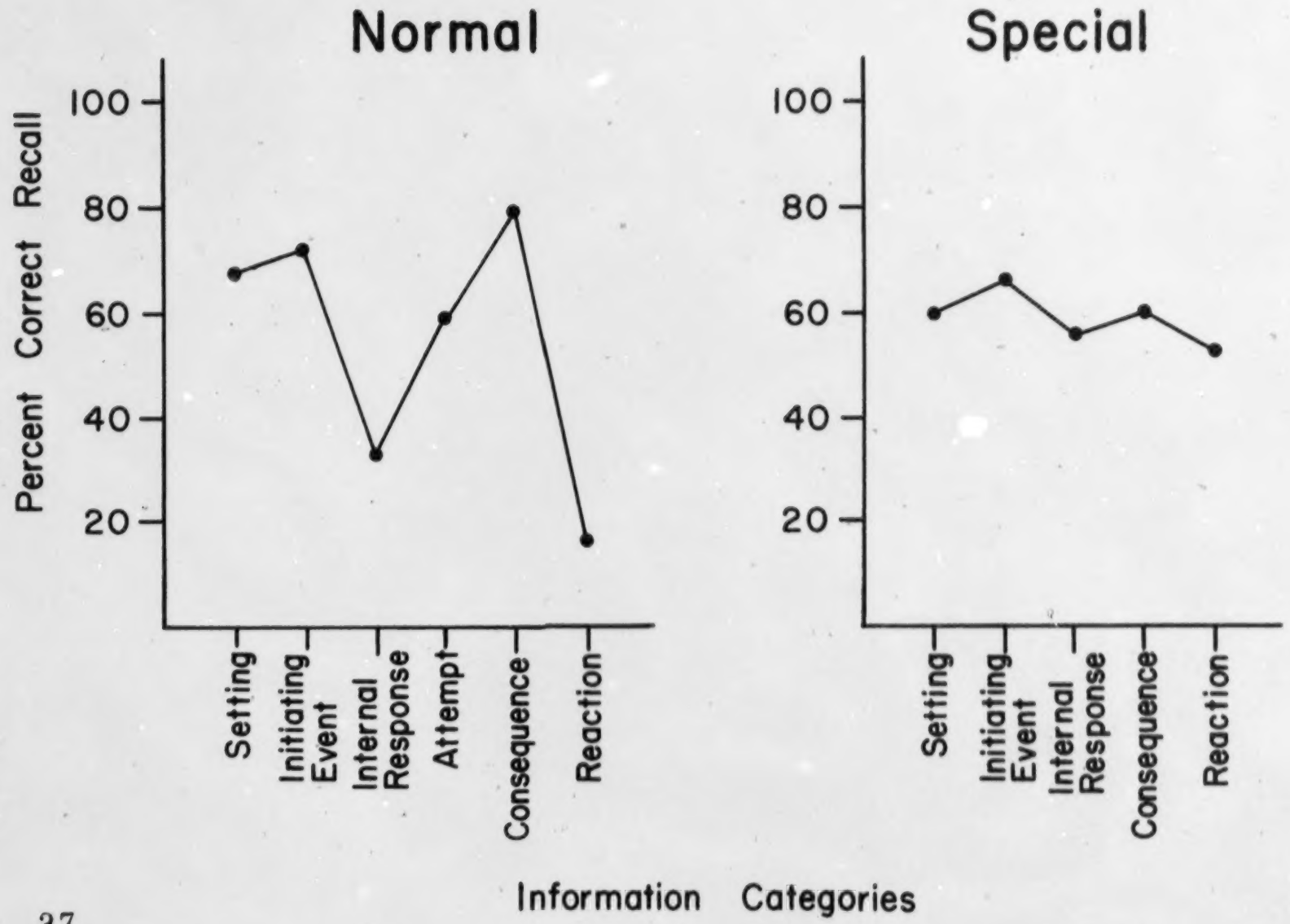
Figure Captions

Figure 1. Morai judgment ratings by kindergarten and third grade children in the control and experimental conditions

Figure 2. Percentage of statements correctly recalled for normal version story grammar statements by all children and for Special information statements by children in the control and experimental conditions.

Figure 3. The percentage of normal version statements recalled by kindergarten and third grade children in the control and experimental conditions.

MEAN RATING
5
4
3
2
1
3rd
K
Control
Setting
Initiating Event
Internal Response
Consequence
Reaction
INFORMATION CATEGORY


Normal
Special
Percent Correct Recall
100
80
60
40
20
Setting
Initiating Event
Internal Response
Attempt
Consequence
Reaction
Information Categories

Percent Correct Recall
100
80
60
40
20
3
K
Control
Setting
Initiating Event
Internal Response
Consequence
Reaction
Information Categories

Appendix A

Normal Version of the Tiger's Whisker Story

Setting	Once there was a woman who lived in a forest.
Initiating Event	One day she was walking up a hill and she came upon the entrance to a lonely tiger's cave.
Internal Response	She really wanted a tiger's whisker and decided to try to get one.
Attempt	She put a bowl of food in front of the opening of the cave and she sang soft music.
	The lonely tiger came out and listened to the music.
Consequence	The lady then pulled out one of his whiskers and ran down the hill very quickly.
Reaction	She knew her trick had worked and felt very happy.

Appendix B

Special Information Categories of the Tiger's Whisker Story

Setting	There was a woman whose husband was very sickly and everyday he took a medicine made with a tiger's whisker.
Initiating Event	One day her husband became very sick and a doctor told her to make a medicine with a tiger's whisker for him.
Internal Response	She knew that her husband was very sick and that he needed a medicine made with a tiger's whisker.
Consequence	She mixed the tiger's whisker with some other things to make a medicine which she gave to her sick husband.
Reaction	The woman knew that now she could make a medicine with the tiger's whisker for her husband who was very sick.

Appendix C

Normal Version of the Fox and the Bear Story

Setting	Once there was a fox and a bear. The fox and the bear were friends.
Initiating Event	One day they were walking on the edge of the woods and they saw a pretty lady carrying a big chocolate cake.
Internal Response	They remembered how delicious chocolate cake tasted and wanted to have some of it.
Attempt	The fox and the bear asked the lady if they could help carry the cake.
Consequence	Before she answered, the fox and the bear took the cake from her hands and ran into the woods.
Reaction	They were glad that their trick had worked and had a good laugh.

Appendix D

Special Information Categories of the Fox and the Bear Story

Setting	There was nothing to eat in the woods and all the animals were starving.
Initiating Event	One day they couldn't find anything to eat in the woods and they began to starve.
Internal Response	They knew there was no food to eat in the woods and thought that they would soon starve.
Consequence	The animals ate the cake which was the only thing to eat in the woods. Now they were no longer starving.
Reaction	They felt happy that they found the only thing to eat in the woods and knew that they would no longer starve.

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